

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Applicant(s): Stoneman, et al.

Application No.: 09/921,495

Filed: 08/03/2001

Title: Eyesafe Q-Switched Er-Doped Solid
State Laser

Attorney Docket No.: CT1108

Group Art Unit: 2828

Examiner: H. Vy

OFFICIALRESPONSE UNDER 37 CFR 1.111Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

In response to the Office Action of Oct. 22, 2003, consider the following remarks:

REMARKS

Reconsideration and further examination is respectfully requested. Claims 1-48 remain in the application.

Applicants have invented a laser device for producing laser radiation at an eyesafe wavelength from a diode-pumped solid-state laser. The device consists of three stages. The first stage is a laser diode whose output pumps the second stage. The second stage is a guided-wave laser, or guided-wave Raman-shifted laser, whose output pumps into the upper laser level of the laser of the third stage. The third stage is an Erbium-doped solid-state crystalline-host laser whose output wavelength is in the eyesafe region.

The Examiner rejected claims 1-15 and 25-28 under 35 U.S.C. 103(a) as being

unpatentable over Scheps, U.S. Patent No. 6,404,785 in view of Ionov, U.S. Patent No. 6,137,813.

Applicants respectfully traverse.

The Examiner stated that "Scheps disclose a device for producing laser radiation comprising a laser diode (102), a guide-wave laser (204) coupled to receive the output emission of the laser diode (fig. 2), and Er-doped solid state crystal laser (114) being pumped by the waveguide laser (fig. 2), ... but Scheps does not disclose the fiber laser. However, Ionov et al. Discloses Yb:doped fiber laser (20)."

Applicants respectfully traverse. Applicants stated in the response to the previous office action, and the Examiner agreed as stated in the present Office Action, element 204 of Scheps is an optical fiber, not a laser.

The Examiner further states that "[I]t would have obvious at the time the invention was made to a person having ordinary skill in the art to modify wave guide fiber as Scheps by having waveguide laser as taught by Ionov et al. So as to gain the advantageous benefit of a wavelength longer than 1.4 microns as invention."

Applicants respectfully traverse. The fiber laser of claims 1 and 25, because it is a laser device, has reflective mirrors on its end surfaces, thereby creating a laser resonator and supplying the feedback required for amplifying the stimulated emission from the laser diode. The passive optical fiber of Scheps does not have these reflective mirror surfaces, and further, such reflective mirror surfaces would be detrimental to the passive optical fiber of Scheps because the mirrors would cause losses that would be detrimental to the operation of the Scheps device. Also, the fiber laser of claims 1 and 25 is doped with active ions, so that it will operate as a laser. Such dopant ions would not be desired in the passive optical fiber of Scheps because they would

absorb the laser diode power, which would be detrimental to the operation of the Scheps invention. Thus Scheps, by using an optical fiber, teaches away from the concept of using a laser. Thus it is not obvious to substitute *any* laser device for the optical fiber of Scheps.

Further, Scheps describes a device having two laser devices. In one embodiment the laser devices are directly coupled, and in another embodiment the laser devices are coupled through a fiber optic device. Nothing in Scheps, however, would suggest that a third laser device be added for any reason. Thus, there is no disclosure or suggestion in the references to add a third laser device. The Examiner is attempting to reconstruct the invention through knowledge gained from Applicants' teachings, which is impermissible under the law.

The test for obviousness under 35 U.S.C. 103 is whether the claimed invention would have been obvious to those skilled in the art in light of the knowledge made available by the reference or references. In re Donovan, 184 USPQ 414, 420, n. 3 (CCPA 1975). It requires consideration of the entirety of the disclosures of the references. In re Rinchart, 189 USPQ 143, 146 (CCPA 1976). All limitations of the Claims must be considered. In re Boe, 184 USPQ 38, 40 (CCPA 1974). In making a determination as to obviousness, the references must be read without benefit of applicants' teachings. In re Meng, 181 USPQ 94, 97 (CCPA 1974). In addition, the propriety of a Section 103 rejection is to be determined by whether the reference teachings appear to be sufficient for one of ordinary skill in the relevant art having the references before him to make the proposed substitution, combination, or other modifications. In re Lintner, 173 USPQ 560, 562 (CCPA 1972).

Further, claims 9 and 10 of the present invention claim a Raman-shifted fiber laser. Neither Scheps nor Lonov, alone or in combination, disclose or suggest a Raman-shifted fiber

laser.

Still further, claims 13-15 all claim an output emission from the fiber laser at or above 1.45 microns, whereas Ionov, et al. Claims an output emission at or below 1150 nm (see Abstract and col. 2, lines 13, 17, and 22). The Examiner states that selecting a "known material on the basis of its suitability" is a matter of obvious design choice. While it may be design choice to choose an element that will cause the laser emission to be at a specific wavelength once such a wavelength is known, it is not a matter of design choice to select the emission wavelength itself, and Applicants' have invented, and claim, an output emission above 1.45 microns. Neither Ionov, et al. nor Scheps, alone or in combination, discloses or suggests using a wavelength above 1150 nm. Thus the choice of wavelength is not obvious nor a matter of design choice.

The Examiner rejected claims 16-24, 26-28 and 40-48 under 35 U.S.C. 103(a) as being unpatentable over Scheps, Ionov and further in view of Muller, U.S. Patent 5,963,575

Applicants respectfully traverse.

Scheps does not disclose a Q-switch for the Er-doped crystal laser, because in Scheps the Er-doped crystal laser is a waveguide laser (112). The waveguide laser geometry is not compatible with insertion of a Q-switch in the laser resonator, because of the integrated, monolithic nature of the waveguide geometry. Therefore, Scheps cannot be modified to Q-switch the waveguide laser, because a waveguide laser is not compatible with insertion of a Q-switch. Applicant's claims 16 and 40 claims Q-switching the Er-doped crystal laser, and Scheps cannot be modified to switch the waveguide laser. Thus neither Scheps nor Muller, alone or in combination discloses or suggests Applicants' Q-switching of claims 16 or 40 or the claims dependent thereon.

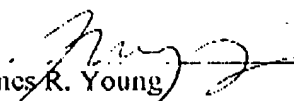
Applicants have made a diligent effort to place the claims in condition for allowance.

However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone James R. Young, Applicants' Attorney at 512-869-2606 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

Mar 22, 2004
Date


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